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EXAMINER

BOYKIN, TERRESSA M

ART UNIT PAPER NUMBER

1711

DATE MAILED: 08/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/506,541

Applicant(s)

PAPKE, NICOLAI

Examiner

Terressa M. Boykin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 112

Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 8 line 4, the language "obtainable by" (rather than ---obtained by---) fails to particularly point out and distinctly claim the invention since one cannot determine from the phrase just which compositions are "obtainable by" applicants' process and which are not. Note further, that the recited "obtainable by" is incorrect terminology and is unclear as to whether the process for preparing such is limited to the specific method as claimed.

Further, it is unclear and indefinite because it infers that the objective *can be obtained by* other means, i.e. polymerization...., and thus fails to meet the requirement of the statute that a claim must particularly point out and distinctly claim what applicant regards as his invention.

A suggested phrase may be "produced by" to avoid ambiguity.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-20 are rejected under 35 U.S.C. 102(b) as being anticipated by US 4259458 note cols. 1-5, Tables and also claims 16, 17, 32, 35 of the reference; US 4417018 see cols. 1-6, Table 5, Example 1 and Claims 1, 2, 3, and 10 .

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US 4259458 discloses molding compositions wherein there is *polymeric reinforcement* comprising a blend of a polyarylate, a polyester, and at least one thermoplastic polymer selected from the group consisting of an aromatic polycarbonate, a styrene resin, an alkyl acrylate resin, a polyurethane, a vinyl chloride polymer, a poly(aryl ether), a copolyetherester block polymer or a polyhydroxyether. These blends have excellent compatibility and can be molded into a variety of articles. Note that the recited "additive" of applicants claimed invention can also be inclusive of the addition polymer of the reference.

The blends of the reference have excellent mechanical properties, better than the properties of a binary blend of polyarylate and a thermoplastic polymer. This is unexpected and allows heretofore unusable binary systems of polyarylate resin and thermoplastic polymer to be molded into articles.

The polyarylates of the reference can be prepared by any of the well known prior art polyester forming reactions, such as the reaction of the acid chlorides of the aromatic dicarboxylic acids with the dihydric phenol, the reaction of the diaryl esters of the aromatic dicarboxylic acids with the dihydric phenols, and the reaction of the aromatic diacids with diester derivatives of the dihydric phenol

The carbonate precursor may be either a carbonyl halide, a carbonate ester or a haloformate. The carbonyl halides which can be employed herein are carbonyl bromide, carbonyl chloride and mixtures thereof. Typical of the carbonate esters which may be employed herein are diphenyl carbonate, di-(halophenyl) carbonates such as di-(chlorophenyl) carbonate, di-(bromophenyl) carbonate, di-(trichlorophenyl) carbonate, di-(tribromophenyl) carbonate, etc., di-(alkylphenyl) carbonates such as di(tolyl) carbonate, etc., di-(naphthyl) carbonate, di-(chloronaphthyl) carbonate, phenyl tolyl carbonate, chlorophenyl chloronaphthyl carbonate, etc. or mixtures thereof

The catalysts which are employed herein can be any of the suitable catalysts that aid the polymerization of bisphenol-A with phosgene. Suitable catalysts include tertiary amines such as, for example, triethylamine, tripropylamine, N,N-dimethylaniline, quaternary ammonium compounds such as, for example, tetraethylammonium bromide, cetyl triethyl ammonium bromide, tetra-n-heptylammonium iodide, tetra-n-propyl ammonium bromide, tetramethylammonium chloride, tetra-methyl ammonium hydroxide, tetra-n-butyl ammonium iodide, benzyltrimethyl ammonium chloride and quaternary phosphonium compounds such as, for example, n-butyltriphenyl phosphonium bromide and methyl-triphenyl phosphonium bromide.

The poly(aryl ether) resin component of the blend of the reference may be described as a linear, thermoplastic polyarylene polyether polysulfone, wherein the arylene units are interspersed with ether and sulfone linkages. These resins may be obtained by reaction of an alkali metal double salt of a dihydric phenol and a dihalobenzenoid compound, either or both of which contain a sulfone

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linkage --SO₂-- between arylene groupings, to provide sulfone units in the polymer chain in addition to arylene units and ether units.

The copolyesters of the reference contain about 25-65% by weight of short chain ester units corresponding to Formula (b) above, the remainder being long chain ester units corresponding to Formula a above. When the copolyesters contain less than about 25% by weight short chain units, the tear strength and solvent resistance of the copolyesters fall to undesirably low levels and when the copolyesters contain more than about 65% short chain units, the low temperature properties worsen and the copolyesters become less elastomeric. The preferred balance of properties is obtained when the short chain ester content is about 55-62%.

The resulting prepolymer is then carried to high molecular weight by distillation of the excess of short chain diol. This process is known as "polycondensation". Additional ester interchange occurs during the distillation to increase the molecular weight and to randomize the arrangement of the copolyester units. Best results are usually obtained if this final distillation or polycondensation is run at less than 1 mm. Hg pressure and 240.degree.-260.degree. C. for less than 2 hours in the presence of antioxidants such as sym-di-beta-naphthyl-phenylene-diamine and 1,3,5-trimethyl-2,4,6-tris[3,5-ditertiary butyl -4 hydroxybenzyl] benzene. Most practical polymerization techniques rely upon ester interchange to complete the polymerization reaction. In order to avoid excessive hold time at high temperatures with possible irreversible thermal degradation, it is advantageous to employ a catalyst for ester interchange reactions. While a wider variety of catalysts can be used, organic titanates such as tetrabutyl titanate used alone or in combination with magnesium or calcium acetates are preferred. Complex titanates, such as those derived from alkali or alkaline earth metal alkoxides and titanate esters are also very effective. Inorganic titanates, such as lanthanum titanate, calcium acetate/antimony trioxide mixtures and lithium and magnesium alkoxides are representative of other catalysts which can be used.

The compositions of the reference are prepared by any conventional mixing methods. For example, a preferred method comprises mixing the polyarylate, polyester, and thermoplastic polymer in powder or granular form in an extruder and extruding the mixture into strands, chopping the strands into pellets and molding the pellets into the desired article.

Other additives include plasticizers; pigments; flame retardant additives, particularly, decabromodiphenyl ether and triarylphosphates, such as triphenylphosphate; reinforcing agents, such as glass fibers; thermal stabilizers; ultraviolet light stabilizers processing aids, impact modifiers and the like.

The constituents which are grafted onto the unsaturated elastomeric backbone are selected from a vinyl aromatic, such as styrene, .alpha.-methylstyrene, alkylstyrene, or mixtures thereof; an acrylate such as the acrylic ester monomers, such as methyl acrylate, ethyl acrylate, butyl acrylate, methyl methacrylate, or

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mixtures thereof; an unsaturated nitrile such as acrylonitrile, methacrylonitrile, or mixtures thereof. It will be understood that the vinyl aromatic, acrylate and acrylonitrile may be used individually or in any combinations in grafting onto the unsaturated elastomeric backbone.

The grafted constituents of the impact modifier will comprise from about 20 to about 60 percent by weight of said constituents such that their tensile modulus does not exceed about 100,000 psi, and is preferably, between about 15,000 to less than about 100,000 psi.

The data in Table 10 shows that the addition of polyarylate/poly(ethylene terephthalate) blends to thermoplastic polyurethanes yields higher modulus products while retaining good strength and ultimate elongation. This method of polymeric reinforcement offers distinct advantages over inorganic filler or fiber reinforcement.

The results disclosed in the Table demonstrate that the block copolymers degrade very rapidly under the test conditions. The addition of a blend of polyarylate/poly(ethylene-terephthalate) to the block copolymer results in improved tensile strength retention of the poly(ether-ester) block copolymer after weathering.

Thus, the reference discloses a thermoplastic composition prepared from the same components as claimed by applicants. As noted above, the recited "additive" of applicants claimed invention can also be inclusive of the addition polymer of the reference. Nevertheless, as also noted in the reference, the grafted constituents of the impact modifier also anticipates applicants invention in that there also exist a covalent bond between the modifier and the thermoplastic polymer. Thus in view of the above there appears to be no significant difference between the reference and that which is claimed by applicant(s). Any differences not specifically mentioned appear to be conventional. Consequently, the claimed invention cannot be deemed as novel and accordingly is unpatentable.

US 4417018 discloses a flame-retardant resin composition comprising (A) at least one polymer resin selected from the group consisting of thermoplastic

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polyesters and thermoplastic polycarbonates and, per 100 parts by weight of the polymer resin, (B) 0.1 to 30 parts by weight, as the weight of the halogen element, of an organic halogen compound, and (C) 0.1 to 20 parts by weight, as the weight of the antimony element, of antimony trioxide treated with an alkoxysilane compound. The composition may further comprise up to 30 parts by weight of an organic acid ester compound and/or up to 200 parts by weight of a filler, per 100 parts by weight of the polymer resin.

Thermoplastic polyesters such as polyethylene terephthalate and polybutylene terephthalate, as well as thermoplastic polycarbonates, have been extensively used in the production of various articles owing to their excellent chemical and physical properties. The reference notes that the properties of these thermoplastic resins have been improved by the addition of various fillers such as fibrous reinforcing materials, e.g. glass fiber and carbon fiber, and inorganic fillers, as well as function-imparting agents such as flame-retardants and the like, and hence are being widely used.

The thermoplastic polyester usable as component (A) in the composition of the present invention includes, representatively, a linear saturated polyester obtained by using terephthalic acid or an ester-forming derivative thereof, an acid component and a glycol with 2 to 10 carbon atoms or an ester-forming derivative thereof as a glycol component. Examples include polyethylene terephthalate, polypropylene terephthalate, polytetramethylene terephthalate (polybutylene terephthalate), polyhexamethylene terephthalate, polycyclohexane-1,4-dimethylol terephthalate, polyneopentyl terephthalate, and the like. Among them, polyethylene terephthalate and polybutylene terephthalate are particularly preferred.

Antimony trioxide treated with an alkoxysilane compound, which is used as the component (C) in the reference, exhibits a function as a flame-retardant agent which assists the flame-retarding property of an organic halogen compound which is used as the component (B). Antimony trioxide may be a naturally existing senarmontite or valentinite or may be obtained by boiling antimony oxychloride, which is obtained by hydrolyzing antimony chloride in a solution of sodium carbonate. Antimony trioxide is usually used together with an organic halogen compound to impart a flame-retarding property to the resins. When the thermoplastic polyester is used as a resin and when antimony trioxide is used, being blended with the organic ester compound, however, the molecular weight of the thermoplastic polyester is greatly reduced when it is melted, and the mechanical strength of the molded article is greatly deteriorated.

An organic acid ester compound may preferably be added to the resin composition of the present invention, especially those wherein the polymer resin mainly contains a thermoplastic polyester, i.e. the polymer resin is comprised of a thermoplastic polyester and 0 to 100 parts by weight, per 100 parts by weight of

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the thermoplastic polyester, of a thermoplastic polycarbonate. The purpose of adding an organic acid ester compound may differ depending upon the class of the organic acid ester compounds. For instance, it may be added to enhance the flowability when the thermoplastic polymer resin is being molded or it may be added as a releasing agent. Also, it may be added as a plasticizer for imparting ductility or it may be added as a crystallization promoting agent to attain great effects.

The reference also discloses the use of tin-type catalyst such as tetraoctyltin or diphenyltin dilaurate or a titanate-type catalyst such as tetrabutyl titanate in order to promote the ring-opening polymerization of ϵ -caprolactone using the polymerization initiators.

The flame-retardant resin composition of the present invention may further contain up to 200 parts by weight of a filler per 100 parts by weight of the polymer resin. Examples of the filler includes fibrous materials such as glass fiber, asbestos, carbon fiber, aromatic polyamide fiber, potassium titanate fiber, steel fiber and ceramics fiber, and powdery, granular or plate-like inorganic fillers such as asbestos, mica, silica, talc, calcium carbonate, glass beads, glass flakes, clay and wollastonite. These fillers are usually blended as reinforcing agents, surface-improving agents, or to improve electric properties, thermal properties or any other properties. Among these fillers, when a glass fiber is used, various advantages are exhibited, such as increased mechanical strength, increased resistance to heat, and reduced shrinkage during molding. There is no particular limitation for the glass fiber provided it is of the type that is usually used for reinforcing the resin. For instance, the glass fiber may be selected from long fiber-type (glass roving) or short fiber-type such as chopped strands and milled fibers. The glass fiber may further be treated with a binder (such as polyvinyl acetate, polyester, or the like), a coupling agent (such as a silane compound, borane compound, or the like), or with any other surface-treating agent. The glass fiber may further be coated with such resins as thermoplastic resins, thermosetting resins, and the like. Glass fiber having long-fiber strands is usually used, being cut to a desired length before or after it is blended with the resin.

See Table 5, Example 1 and Claims 1, 2, 3, and 10 of the reference.

Thus, the reference discloses a thermoplastic composition prepared from the same components as claimed by applicants. Thus in view of the above there appears to be no significant difference between the reference and that which is claimed by applicant(s). Any differences not specifically mentioned appear to be conventional. Consequently, the claimed invention cannot be deemed as novel and accordingly is unpatentable.

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Correspondence

Please note that the cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site (www.uspto.gov), from the Office of Public Records and from commercial sources. Applicants may be referred to the Electronic Business Center (EBC) at <http://www.uspto.gov/ebc/index.html> or 1-866-217-9197.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Terressa Boykin whose telephone number is 571 272-1069. The examiner can normally be reached on Monday through Friday from 6:30am to 3:00pm.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. The general information number for listings of personnel is (571-272-1700).

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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